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Customer Number

Patent  
Case No.: 59102US002

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: BRIERS, JORIS

Application No.: 10/702,342

Group Art Unit: 1713

Filed: November 6, 2003

Examiner: Mulcahy, Peter D.

Title: MELT PROCESSABLE COMPOSITIONS

BRIEF ON APPEAL

Mail Stop: Appeal Brief-Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

## CERTIFICATE OF MAILING OR TRANSMISSION [37 CFR § 1.8(a)]

I hereby certify that this correspondence is being:

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- ☒ transmitted by facsimile on the date shown below to the United States Patent and Trademark Office at 571-273-8300.

Date

Signed by: Angela M. Zontelli

Dear Sir:

This is an appeal from the Office Action dated March 24, 2006, which was supplemented by the Advisory Action dated May 10, 2006.

A Notice of Appeal in this application was submitted via EFS-web on June 22, 2006, and was received in the USPTO on June 22, 2006.

It is believed that this brief is timely filed according to 37 CFR § 41.37(a)(1). Please charge the appropriate fee for filing an appeal brief as set forth in 37 CFR § 41.20(b)(2), and any other appropriate fees, to Deposit Account No. 13-3723.

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Application No.: 10/702,342Case No.: 59102US002**REAL PARTY IN INTEREST**

The real party in interest is 3M Company of St. Paul, Minnesota and its affiliate 3M Innovative Properties Company of St. Paul, Minnesota.

**RELATED APPEALS AND INTERFERENCES**

Appellants are unaware of any related appeals or interferences.

**STATUS OF CLAIMS**

Claims 1, 3-10 and 12-16 have been rejected and are the claims on appeal. Claims 2 and 11 are cancelled.

**STATUS OF AMENDMENTS**

No amendments were made after the final rejection.

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**SUMMARY OF CLAIMED SUBJECT MATTER**

Independent claim 1 at issue relates to a melt processable composition comprising one or more thermoplastic hydrocarbon polymers and a fluoropolymer processing aid. The fluoropolymer processing aid has a poly(oxyalkylene) polymer and a fluoropolymer. The fluoropolymer has interpolymers of vinylidene fluoride and at least one other monomer wherein the vinylidene fluoride content of the fluoropolymer is greater than 75% by weight. The melt processable composition, upon extrusion, achieves an extrudate exhibiting no melt defects at a lower level of fluoropolymer processing aid when compared to a standard processing aid system.

**GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

- I. Claims 1, 3-10, and 12-16 stand rejected under 35 USC § 103(a) as purportedly being unpatentable over U.S. Patent No. 5,015,693 to Duchesne et al. [hereinafter Duchesne].

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ARGUMENT

- I. **The rejection of 1, 3-10, and 12-16 under 35 USC § 103(a) as purportedly being unpatentable over Duchesne is unwarranted and should be reversed.**

Fluoropolymers have been shown to be useful as processing aids in the melt processing of polymeric materials, such as polyolefins. The polymeric materials possess certain viscoelastic characteristics that, when melt processed, may result in undesirable defects in the finished material. This is particularly evident in extrusion processes for a given extrudable polymer where there exists a critical shear rate above which the surface of the extrudate exhibits melt defects. The melt defects may be present as a rough surface on the extrudate, commonly referred to as melt fracture. Melt fracture may take the form of "sharkskin", a loss of surface gloss, that in more serious manifestations appears as ridges running more or less transverse to the extrusion direction. The extrudate may, in more severe cases, undergo "continuous melt fracture" where the surface becomes grossly distorted.

The melt processable compositions of claim 1 are directed toward compositions that comprise, *inter alia*, a fluoropolymer processing aid that is more efficient than conventional processing aids in eliminating problems associated with the melt processing of thermoplastic hydrocarbon polymers.

Claim 1

The Patent Office has failed to establish a prima facie case of obviousness for rejecting claim 1 over Duchesne. First, the Patent Office has not shown where Duchesne teaches, suggests or describes all of the elements of claim 1. Second, the Patent Office has failed to show a motivation to modify Duchesne to meet the limitations of claim 1. Furthermore, the Appellants have shown surprising results achieved by the melt processable compositions of claim 1. For at least these reasons, the rejection of claim 1 under 35 USC § 103(a) as purportedly being unpatentable over Duchesne is improper and should be reversed.

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The Patent Office has failed to establish a prima facie case of obviousness for claim 1 in view of Duchesne. Duchesne relates generally to extrudable thermoplastic hydrocarbon polymer compositions. The compositions in Duchesne are described as comprising a thermoplastic hydrocarbon polymer, a poly(oxyalkylene) polymer and a fluorocarbon polymer. Duchesne does not describe, however, "a fluoropolymer having interpolymerized units of vinylidene fluoride and at least one other monomer wherein the vinylidene fluoride content of the fluoropolymer is greater than 75% by weight" as required by claim 1.

In the final Office Action dated March 24, 2006, the Patent Office initially characterized the claims as requiring a vinylidene fluoride content of the fluoropolymer of at least 85%. The Patent Office further asserted that because Duchesne teaches the use of fluoropolymers wherein a copolymer with vinylidene fluoride is present in an amount as low as 15%, that the remaining polymer would comprise 85% vinylidene fluoride and therefore the claims are rendered prima facie obvious.

The Appellants called the Patent Office attention to the error in both the Patent Office reading of the claimed invention as well as the description in Duchesne. With respect to the claims, they required, at the time, 75% by weight vinylidene fluoride, not 85%. Further, with respect to Duchesne it was taught that: "The elastomeric copolymers of perfluoropropylene and vinylidene fluoride having between about 15 and 50 mole percent perfluoropropylene, optionally with the addition of up to 5 to 30 mole percent tetrafluoroethylene, are particularly useful." Thus, the description in Duchesne relates to mole percent, not weight percent. Converting to weight percent, the Appellants pointed out, Duchesne refers to a polymer having only 70.7 weight percent vinylidene fluoride.

In the Advisory Action, the Patent Office acknowledged that claim 1 relates to fluoropolymers comprising greater than 75% by weight vinylidene fluoride. With this acknowledgement, it is clear that Duchesne does not teach "a fluoropolymer having interpolymerized units of vinylidene fluoride and at least one other monomer wherein the vinylidene fluoride content of the fluoropolymer is greater than 75% by weight" as required by claim 1. Thus, the Patent Office has failed to identify all of the claim elements in the cited art (Duchesne). Accordingly, the Patent Office has failed to establish a prima facie case of obviousness.

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The Patent Office attempted to overcome the clear deficiency in by asserting that because Duchesne recited "between about 15 and 50 mole percent" of the comonomer, that "sufficient flexibility in the amount of comonomer" is imparted by the term "about" "so as to render the claimed 75% by weight prima facie obvious". (internal quotations omitted).

Appellants submit that the Patent Office has not shown a motivation to modify the description of Duchesne to arrive at the present claim 1. It has long been established that "while it may ordinarily be the case that the determination of optimum values for the parameters of a prior art process would be at least prima facie obvious, that conclusion depends upon what the prior art discloses with respect to those parameters. Where, as here, the prior art disclosure suggests the outer limits of the range of suitable values, and that the optimum resides within that range, the determination of optimum values outside that range may not be obvious...in an area of technology shown to be highly unpredictable in process values, the discovery of optimum values not in any way suggested by the prior art is more likely to be *unobvious* than obvious within the meaning of §103". (In re Sebek, 175 USPQ 93, 95, 465 F.2d 904, 907 (C.C.P.A. 1972), (emphasis in original)).

Appropriately applied, *In re Sebek* prohibits the Patent Office from extrapolating the content of vinylidene fluoride described in Duchesne to arrive at the melt processable compositions of claim 1.

*In re Sebek* provides three criteria for consideration: (1) a suggestion for outer limits of a range, (2) a suggestion for optimization is found within that range, and (3) indications that the technology is unpredictable.

Duchesne itself provides the first two criteria from *In re Sebek*. Duchesne states that particularly useful elastomeric copolymers of perfluoropropylene and vinylidene fluoride have "between about 15 and 50 mole percent perfluoropropylene". This is a clear suggestion of outer limits, with an accompanying implicit indication that optimization should take place within those limits.

The present application demonstrates the unpredictability of the art. The present application generally recognizes that the specific amount of fluoropolymer required to clear melt fracture, as well as the time necessary to clear melt fracture, may vary depending on the polyolefin, the type of fluoropolymer, process equipment, and process conditions. Surprisingly, however, the present application demonstrates that for otherwise identical conditions, higher levels of vinylidene

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fluoride in a fluoropolymer processing aid composition than taught in Duchesne leads to a substantial decrease in the amount of fluoropolymer processing aid required to reduce melt defects when compared to the fluoropolymer processing aids described in Duchesne.

For instance, Comparative Example 1 utilizes a fluoropolymer having 60 weight % vinylidene fluoride monomer content and 40 weight % perfluoropropylene. The polymer of Comparative Example 1, therefore, falls within the range taught by Duchesne. Example 1, in contrast, utilizes a 90 weight % vinylidene fluoride content with 10 weight % perfluoropropylene. Extrusion of the two samples shows that the fluoropolymer level required to clear melt fracture in Comparative Example 1 (according to Duchesne) is 1600 parts per million, whereas for Example 1 it is less than half, 700 parts per million. Similar results are observed when comparing Comparative Examples 2, 3, 4, and 6 (each within the range described in Duchesne) to Examples 2, 3, 4, and 5 (each within the limitations of claim 1), respectively.

Applying the principles of *In re Sebek*, the Patent Office extrapolation of the teachings of Duchesne is improper. There is no motivation in Duchesne itself for such a modification of the teachings therein. Thus, the Patent Office has further failed to establish a prima facie case of obviousness. Furthermore, the Appellants have shown that surprising results can be obtained in this unpredictable art by the use of higher vinylidene fluoride content fluoropolymers in the melt processable compositions of claim 1. Thus, to the extent that the Patent Office has, arguendo, established a prima facie case of obviousness, the showing is rebutted by the surprising results demonstrated by Appellants in the present application.

The Patent Office has failed to show where Duchesne teaches, suggests or describes the limitations of claim 1. Furthermore, the Patent Office has improperly extrapolated beyond the range taught in Duchesne in an attempt to overcome this deficiency. Accordingly, the Appellants kindly submit that the rejection by the Patent Office is inappropriate and must therefore be reversed.

#### CONCLUSION

For the proposed combination of references, the Patent Office has failed to establish a prima facie case of obvious. The Patent Office has failed to show all of the elements of claim 1 in Duchesne and failed to show a motivation to modify the teachings of Duchesne to experiment



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outside the ranges taught therein. Furthermore, the Appellants have demonstrated surprising results with regard to the melt processable compositions of claim 1. For at least these reasons, the rejection of claims 1, 3-10, and 12-16 under 35 USC § 103(a) is improper and should be reversed.

8/22/06  
\_\_\_\_\_  
Date

Respectfully submitted,

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CLAIMS APPENDIX

1. (Previously Presented) A melt processable composition comprising:
  - (a) one or more thermoplastic hydrocarbon polymers;
  - (b) a fluoropolymer processing aid having
    - (i) poly(oxyalkylene) polymer; and
    - (ii) a fluoropolymer having interpolymerized units of vinylidene fluoride and at least one other monomer wherein the vinylidene fluoride content of the fluoropolymer is greater than 75% by weight, and wherein said melt processable composition upon extrusion achieves an extrudate exhibiting no melt defects at a lower level of said fluoropolymer processing aid when compared to a standard processing aid system.
2. (Canceled)
3. (Original) The composition as recited in claim 1, wherein said fluoropolymer processing aid has a poly(oxyalkylene) polymer to fluoropolymer ratio of 1:1 or greater.
4. (Original) The composition as recited in claim 1, wherein said melt processable composition has a fluoropolymer content of 400 ppm or less.
5. (Original) The composition as recited in claim 1, further comprising light stabilizers, antioxidants, antiblocking agents, slip agents, lubricants, fillers, flame retardants, foaming agents, nucleating agents, clarifying agents, colorants, coupling agents, compatibilizers, antistatic agents, antifogging agents, heat stabilizers, plasticizers, reinforcing agents, metal scavengers, acid/base scavengers, biocides or combinations thereof.
6. (Original) The composition as recited in claim 1, wherein the fluoropolymer is a thermoplastic polymer.
7. (Original) A melt processable composition comprising:

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(a) one or more thermoplastic hydrocarbon polymers;  
(b) a fluoropolymer processing aid having  
(i) poly(oxyalkylene) polymer; and  
(ii) a thermoplastic copolymer having interpolymerized units of vinylidene fluoride and at least one other monomer, wherein the vinylidene fluoride content of the fluoropolymer is greater than 85% by weight, and wherein said melt processable composition upon extrusion achieves an extrudate exhibiting no melt defects.

8. (Original) The composition as recited in claim 7, wherein said fluoropolymer processing aid has a poly(oxyalkylene) polymer to fluoropolymer ratio of 1:1 or greater.

9. (Original) The composition as recited in claim 7, wherein said melt processable composition has a fluoropolymer content of 400 ppm or less.

10. (Previously Presented) A melt processable composition comprising:

(a) one or more thermoplastic hydrocarbon polymers;  
(b) a fluoropolymer processing aid having  
(i) poly(oxyalkylene) polymer; and  
(ii) a fluoropolymer having interpolymerized units of vinylidene fluoride and at least one other monomer wherein the vinylidene fluoride content of the fluoropolymer is greater than 75% by weight and the amount of fluoropolymer in the melt processable composition is less than 200 ppm.

11. (Canceled)

12. (Original) The composition as recited in claim 10, wherein said fluoropolymer processing aid has a poly(oxyalkylene) polymer to fluoropolymer ratio of 1:1 or greater.

13. (Original) The composition as recited in claim 10, further comprising light stabilizers, antioxidants, antiblocking agents, slip agents, lubricants, fillers, flame retardants, foaming

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agents, nucleating agents, clarifying agents, colorants, coupling agents, compatibilizers, antistatic agents, antifogging agents, heat stabilizers, plasticizers, reinforcing agents, metal scavengers, acid/base scavengers, biocides or combinations thereof.

14. (Original) The composition as recited in claim 10, wherein the fluoropolymer is a thermoplastic polymer.

15. (Previously Presented) A fluoropolymer processing aid comprising:

(a) poly(oxyalkylene) polymer; and

(b) a fluoropolymer having interpolymerized units of vinylidene fluoride and at least one other monomer wherein the vinylidene fluoride content of the fluoropolymer is greater than 75% by weight, and wherein fluoropolymer processing aid when added to a melt processable composition, achieves an extrudate exhibiting no melt defects at a lower level of fluoropolymer processing aid when compared to a standard processing aid system.

16. (Original) The composition as recited in claim 15, wherein the fluoropolymer is a thermoplastic copolymer and the vinylidene fluoride content of the fluoropolymer is greater than 85% by weight.

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<b>FACSIMILE TRANSMITTAL FORM</b>	Application Number	10/702342
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	Examiner Name	Peter D. Mulcahy
Fax: 571-273-8300	Attorney Docket Number	59102US002
Total Number of Pages in This Submission: 13		
Date: August 22, 2006	Attorney for Applicant: C. Michael Geise	

ENCLOSURES (check all that apply)		
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<input type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/Declaration(s)	<input type="checkbox"/> Petition to Convert a Provisional Application	<input checked="" type="checkbox"/> Appeal Communication to Technology Center (Appeal Notice, Brief, Reply Brief)
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<input type="checkbox"/> Express Abandonment Request	<input type="checkbox"/> Change of Correspondence Address	<input type="checkbox"/> Status Letter
<input type="checkbox"/> Information Disclosure Statement	<input type="checkbox"/> Terminal Disclaimer	<input type="checkbox"/> Other Enclosures:
<input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR § 1.52 or 1.53 <input type="checkbox"/> Response to Missing Parts under 35 USC 371 in US Designated/ Elected Office (DO/EO/US)	<input type="checkbox"/> Request for Refund	
	<input type="checkbox"/> Request for Continued Examination (RCE) Transmittal	
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